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at Riverside. They were very tame, and twice alighted on our hats. Montana is somewhat south of their usual breeding range, but the date on which these birds were noted, August 18, seems rather early for migration.

Spinus pinus. Pine Siskin. Noted in two places, Cabin Parks and on Mt. Baptiste at 6500-7000 feet.

Passerculus sandwichensis alaudinus. Western Savannah Sparrow. A few seen in the grassy meadows at Cabin Parks, and at Spotted Bear.

Junco hyemalis, subsp. Junco. Small flocks of juncos were common as far as Cabin Parks. They closely resembled *mearnsi*, but may have been *montanus*, with which form I am not familiar.

Petrochelidon lunifrons lunifrons. Cliff Swallow. A flock was noted August 21 a few hundred feet below the top of Mt. Baptiste (8400 feet), at about timberline. Probably migrants.

Dendroica auduboni auduboni. Audubon Warbler. Small bands of this warbler were common, and formed the only indication of warbler migration.

Geothlypis trichas occidentalis. Western Yellow-throat. One seen at Cabin Parks.

Wilsonia pusilla pileolata. Pileolated Warbler. One seen near Spotted Bear.

Cinclus mexicanus unicolor. Dipper. Common all along the river, and heard singing several times.

Nannus hiemalis pacificus. Western Winter Wren. Common along the trail.

Certhia familiaris montana. Rocky Mountain Creeper. Noted here and there; not uncommon.

Sitta canadensis. Red-breasted Nuthatch. Common. Its note was one of the characteristic bird sounds of the valley.

Penthestes atricapillus septentrionalis. Long-tailed Chickadee. Common along the trail at least as far as Coalbank.

Penthestes gambeli gambeli. Mountain Chickadee. Noted at Silver Basin and Spotted Bear Mountain at about 6500 feet.

Penthestes hudsonicus hudsonicus. Hudsonian Chickadee. Two were seen on Spotted Bear Mountain in the Douglas fir forest at about 6500 feet.

Penthestes rufescens rufescens. Chestnut-backed Chickadee. A few noted at Coalbank in the same region frequented by the Long-tailed Chickadees.

Regulus satrapa, subsp. Golden-crowned Kinglet. Common and well distributed.

Planesticus migratorious propinquus. Western Robin. Seen only at Riverside and Spotted Bear.

Ixoreus naevius (meruloides?). Varied Thrush. One bird seen twice near Coalbank under excellent conditions for observation. It was carrying a grub on one occasion as though feeding young.

Madison, Wisconsin, April 16, 1916.

THE SAHUARO SCREECH OWL AS A RECOGNIZABLE RACE

By H. S. SWARTH

(Contribution from the University of California Museum of Vertebrate Zoology)

THE SAHUARO Screech Owl (*Otus asio gilmani*) described by the present writer some years ago (Univ. Calif. Publ. Zool., 7, 1910, p. 1), although admitted to the list of North American birds by the A. O. U. Committee, has been denied recognition by the latest monographer of the genus, Robert Ridgway, in his Birds of North and Middle America (part 6, 1914, p. 702, footnote). Here the conception of two subspecies of *Otus asio* existing in southern Arizona is objected to in no uncertain terms. The expression of such positive statements of fact and opinion, from so competent an authority, is certainly worthy of the most respectful consideration, and I must confess, upon first reading this criticism, to feeling decidedly unsettled in my convictions, and to wondering if perhaps my own conclusions had not been erroneous.

This feeling was measurably heightened by the receipt in November, 1915, from Mrs. J. W. Wheeler, of Tucson, Arizona, of a freshly killed screech owl, secured by her in the vicinity of her home on the outskirts of that city. This bird, taken within the range of *Otus asio gilmani*, was remarkably like *O. a. cineraceus* in appearance, in fact I was unable to see that it differed in any way from the one or two examples of that form that were then available for comparison. This fact, coupled with Ridgway's statement of his inability to distinguish between the two forms, while tending to shake my previous conviction of their distinctiveness, impelled me to look into the matter as thoroughly as circumstances permitted.

During the past winter Mr. A. B. Howell, of Covina, California, has devoted several months to field work in the vicinity of Tucson, his collection including a series of seven screech owls from that region. These specimens he has kindly loaned me. Mr. J. Eugene Law has similarly placed at my disposal nine Arizona screech owls contained in his collection. These series together with the specimens at the Museum of Vertebrate Zoology, give a total of thirty skins, from the following points: Chiricahua Mountains, 6; Huachuca Mountains, 3; Tucson and Fort Lowell, 12; Phoenix, 2; Blackwater, 2; points on the Colorado River, from Fort Mohave to Yuma, 5.

The most cursory examination of this assemblage is sufficient to show that there *are* two types of coloration exhibited, the darker, clearer gray *cinereus*, with coarser markings and extension of black areas, and the paler *gilmani* with much finer pencillings. A preliminary division of specimens according to color, and without consulting labels, was readily accomplished, but it was a somewhat disconcerting result to find in the *cinereus* group four skins from a point within the habitat of *gilmani*. These were, the one bird referred to above (Swarth coll. no. 10051, female, Tucson, Arizona, November 20, 1915), and three others from the Howell collection, all from Fort Lowell, near Tucson (no. 6205, male, December 26, 1915; no. 6245, female, January 4, 1916; no. 6299, female, January 24, 1916). These birds are, as far as I can see, indistinguishable in color and markings from specimens taken in the Chiricahua and Huachuca mountains, and if similar skins from lowland localities have been used by others in making comparisons I can well understand why the subspecies *gilmani* might be discredited thereby.

The point to be made here, however, is that these four are all winter birds, taken at the immediate base of a high mountain range, a range that should be, and probably is, inhabited by *cinereus*. The inference to be drawn is, as I believe, that they are individuals whose summer home lies at higher levels, that they are, in fact, examples of *cinereus* which have migrated downward into the range of *gilmani*.

Taking the evidence presented by this series as a whole, we have the following facts: There *are* two distinct types represented, *cinereus* from the higher mountains, *gilmani* from the valleys of southwestern Arizona. Breeding birds from either region are true to type in their appearance. Extremes of the *gilmani* characteristics appear at points farthest from the known range of *cinereus* (as at Phoenix and on the Colorado River). At one point at the margin of the habitat of *gilmani* (as I conceive it) there occur in winter examples of *cinereus*.

There are certain facts in the distribution of screech owls in Arizona which deserve to be emphasized. My conception of *Otus a. gilmani* is of a bird of the hot Lower Sonoran valleys, and of *Otus a. cinereus*, as one pertaining

to Upper Sonoran, oak-covered foothills and canyons. But I believe that a sufficient representation of specimens would show the respective ranges of the two subspecies to be capable of definition in other terms than those of life zones. In southeastern Arizona, the region of the scattered mountain ranges where *cineraceus* occurs, the intervening valleys and plains, of vast extent, are for the most part grass covered, or else with but a sparse growth of mesquite or larrea, in neither case supplying habitable surroundings for the screech owl. Farther west, from the Santa Rita and Santa Catalina mountains westward, the endless stretches of Lower Sonoran plains where *gilmani* is found are grown up nearly everywhere with the giant cactus, which supplies so many hole-dwelling birds with homes. In other words, in southwestern Arizona the Lower Sonoran zone offers congenial surroundings to screech owls, in southeastern Arizona for the most part it does not. In southwestern Arizona, Lower Sonoran is the only life zone represented, in southeastern Arizona the higher zones occur, with associational conditions acceptable to these owls. Certain parts of the foothill region of the Santa Rita and Santa Catalina mountains are where the widely different zonal and associational conditions of the eastern and western extremes find a meeting place. It is in this region that conditions occur that predicate the possibility of finding both of the subspecies of *Otus asio* here treated (as we see has been the case), or of finding specimens intermediate in their characters between the two extremes. There are specimens from Fort Lowell at hand that might be regarded in this light.

It may be said here that the Lower Sonoran areas of southeastern and southwestern Arizona, respectively, are widely different in their general aspects, and contain strongly contrasted assemblages of animal and plant life. There still remains to be accomplished, as a highly desirable piece of zoological work, a critical comparative study of the animal life of certain of these closely adjacent but faunally unlike valleys.

As to the characters of color and markings distinguishing *cineraceus* and *gilmani*, these are such as can not well be demonstrated other than by assertion. I can merely re-affirm that the screech owls of the *Otus asio* group from southern Arizona are of distinguishable types from two definable regions, exhibiting color differences readily apparent to the eye. In measurements it will be seen from the accompanying table that, although the differences are not great, the maximum of size is in *cineraceus*, the minimum in *gilmani*.

MEASUREMENTS IN MILLIMETERS OF *Otus asio cineraceus* AND *O. a. gilmani*
Wing Tail Bill
(from nostril to tip)

<i>Otus asio cineraceus</i> : 4 males from Huachuca and Chiricahua Mts., Arizona	154.7 (149.0-160.0)	79.2 (77.5-82.0)	10.7 (10.5-11.0)
<i>Otus asio gilmani</i> : 4 males from Fort Lowell and Blackwater, Arizona	150.0 (147.0-155.0)	74.2 (73.0-76.0)	10.5 (10.0-11.0)
<i>Otus asio cineraceus</i> : 4 females from Huachuca and Chiricahua Mts., Arizona	161.7 (157.0-168.0)	84.1 (82.5-86.0)	10.8 (10.2-11.2)
<i>Otus asio gilmani</i> : 4 females from Tucson, Phoenix, Colorado R., and Blackwater, Arizona	153.2 (150.0-156.0)	77.1 (74.0-80.5)	10.8 (10.5-11.0)

Berkeley, California, June 20, 1916.